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Conditions for Using Stimulated Photon Echo to Record and Reproduce Information in Three-Level Systems

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Abstract

© 2016, Springer Science+Business Media New York.The conditions for observing photon echo signals in crystals with excitation and detection in different resonant transitions with a single common energy level are studied. Uncorrelated inhomogeneous broadening in different resonance transitions is shown to influence the formation of stimulated photon echo in three-level systems. Lowering the sample temperature makes it possible to increase the relaxation time, which is used in experiments for observing photon echo. Uncorrelated inhomogeneous broadening in different resonance transitions is temperature independent and affects the intensity of the response at low temperatures, as well. Observation of stimulated photon echo in solid three-level samples requires a correct choice of the time interval between the first and second exciting pulses, but is not related to the magnitude of the irreversible transverse relaxation of the system.

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Keywords

correlation coefficient, spectral nonequidistance parameter, stimulated photon echo, three-level system